

CLAIMS:

1. An isolated polypeptide comprising an amino acid sequence which has at least 70% identity to the amino acid sequence selected from the group consisting of: SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, SEQ ID NO : 90.
2. An isolated polypeptide as claimed in claim 1 in which the amino acid sequence has at least 95% identity to the amino acid sequence selected from the group consisting of: SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, SEQ ID NO : 90.
3. The polypeptide as claimed in claim 1 comprising the amino acid sequence selected from the group consisting of: SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, SEQ ID NO : 90.

NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID
 NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID
 NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID
 NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID
 5 NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID
 NO : 88, SEQ ID NO : 90.

4. An isolated polypeptide of SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID
 NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID
 10 NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID
 NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID
 NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID
 NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID
 NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID
 15 NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID
 NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID
 NO : 88, SEQ ID NO : 90.

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20 5. An immunogenic fragment of the polypeptide as claimed in any one of claims 1 to 4 in
 which the immunogenic activity of said immunogenic fragment is substantially the same
 as the polypeptide of SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ
 ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ
 ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ
 ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ
 25 ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ
 ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ
 ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ
 ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ
 ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, SEQ
 30 ID NO : 90.

6. An isolated polynucleotide comprising a nucleotide sequence encoding a polypeptide that

has at least 70% identity to the amino acid sequence of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, or 100 over the entire length of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, or 90 respectively; or a nucleotide sequence complementary to said isolated polynucleotide.

7. An isolated polynucleotide comprising a nucleotide sequence that has at least 70% identity to a nucleotide sequence encoding a polypeptide of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, or 90 over the entire coding region; or a nucleotide sequence complementary to said isolated polynucleotide.

8. An isolated polynucleotide which comprises a nucleotide sequence which has at least 70% identity to that of SEQ ID NO : 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, or 89 over the entire length of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, or 89 respectively; or a nucleotide sequence complementary to said isolated polynucleotide.

9. The isolated polynucleotide as claimed in any one of claims 6 to 8 in which the identity is at least 95% to SEQ ID NO : 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, or 89.

10. An isolated polynucleotide comprising a nucleotide sequence encoding the polypeptide of SEQ ID NO: 2, SEQ ID NO : 4, SEQ ID NO: 6, SEQ ID NO: 8, SEQ ID NO : 10, SEQ

ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, SEQ ID NO : 90.

11. An isolated polynucleotide comprising the polynucleotide of SEQ ID NO : 1, SEQ ID NO : 3, SEQ ID NO : 5, SEQ ID NO : 7, SEQ ID NO : 9, SEQ ID NO : 11, SEQ ID NO : 13, SEQ ID NO : 15, SEQ ID NO : 17, SEQ ID NO : 19, SEQ ID NO : 21, SEQ ID NO : 23, SEQ ID NO : 25, SEQ ID NO : 27, SEQ ID NO : 29, SEQ ID NO : 31, SEQ ID NO : 33, SEQ ID NO : 35, SEQ ID NO : 37, SEQ ID NO : 39, SEQ ID NO : 41, SEQ ID NO : 43, SEQ ID NO : 45, SEQ ID NO : 47, SEQ ID NO : 49, SEQ ID NO : 51, SEQ ID NO : 53, SEQ ID NO : 55, SEQ ID NO : 57, SEQ ID NO : 59, SEQ ID NO : 61, SEQ ID NO : 63, SEQ ID NO : 65, SEQ ID NO : 67, SEQ ID NO : 69, SEQ ID NO : 71, SEQ ID NO : 73, SEQ ID NO : 75, SEQ ID NO : 77, SEQ ID NO : 79, SEQ ID NO : 81, SEQ ID NO : 83, SEQ ID NO : 85, SEQ ID NO : 87, SEQ ID NO : 89.

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12. An isolated polynucleotide comprising a nucleotide sequence encoding the polypeptide of SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ

ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, or SEQ ID NO : 90, obtainable by screening an appropriate library under stringent hybridization conditions with a labeled probe having the sequence of SEQ ID NO : 1, SEQ ID NO : 3, SEQ ID NO : 5, SEQ ID NO : 7, SEQ ID NO : 9, SEQ ID NO : 11, SEQ ID NO : 13, SEQ ID NO : 15, SEQ ID NO : 17, SEQ ID NO : 19, SEQ ID NO : 21, SEQ ID NO : 23, SEQ ID NO : 25, SEQ ID NO : 27, SEQ ID NO : 29, SEQ ID NO : 31, SEQ ID NO : 33, SEQ ID NO : 35, SEQ ID NO : 37, SEQ ID NO : 39, SEQ ID NO : 41, SEQ ID NO : 43, SEQ ID NO : 45, SEQ ID NO : 47, SEQ ID NO : 49, SEQ ID NO : 51, SEQ ID NO : 53, SEQ ID NO : 55, SEQ ID NO : 57, SEQ ID NO : 59, SEQ ID NO : 61, SEQ ID NO : 63, SEQ ID NO : 65, SEQ ID NO : 67, SEQ ID NO : 69, SEQ ID NO : 71, SEQ ID NO : 73, SEQ ID NO : 75, SEQ ID NO : 77, SEQ ID NO : 79, SEQ ID NO : 81, SEQ ID NO : 83, SEQ ID NO : 85, SEQ ID NO : 87, or SEQ ID NO : 89, or a fragment thereof.

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15 13. An expression vector or a recombinant live microorganism comprising an isolated polynucleotide according to any one of claims 6-12.

14. A host cell comprising the expression vector of claim 13 or a membrane of said host cell expressing an isolated polypeptide comprising an amino acid sequence that has at least 70% identity to the amino acid sequence selected from the group consisting of : SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, or SEQ ID NO : 90.

30 15. A process for producing a polypeptide comprising an amino acid sequence that has at

least 70% identity to the amino acid sequence selected from the group consisting of:

SEQ ID NO:2, SEQ ID NO : 4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO : 10, SEQ ID NO : 12, SEQ ID NO : 14, SEQ ID NO : 16, SEQ ID NO : 18, SEQ ID NO : 20, SEQ ID NO : 22, SEQ ID NO : 24, SEQ ID NO : 26, SEQ ID NO : 28, SEQ ID NO : 30, SEQ ID NO : 32, SEQ ID NO : 34, SEQ ID NO : 36, SEQ ID NO : 38, SEQ ID NO : 40, SEQ ID NO : 42, SEQ ID NO : 44, SEQ ID NO : 46, SEQ ID NO : 48, SEQ ID NO : 50, SEQ ID NO : 52, SEQ ID NO : 54, SEQ ID NO : 56, SEQ ID NO : 58, SEQ ID NO : 60, SEQ ID NO : 62, SEQ ID NO : 64, SEQ ID NO : 66, SEQ ID NO : 68, SEQ ID NO : 70, SEQ ID NO : 72, SEQ ID NO : 74, SEQ ID NO : 76, SEQ ID NO : 78, SEQ ID NO : 80, SEQ ID NO : 82, SEQ ID NO : 84, SEQ ID NO : 86, SEQ ID NO : 88, or SEQ ID NO : 90 comprising culturing a host cell of claim 18 under conditions sufficient for the production of said polypeptide and recovering the polypeptide from the culture medium.

51 16. A process for expressing a polynucleotide of any one of claims 6 – 12 comprising transforming a host cell with the expression vector comprising at least one of said polynucleotides and culturing said host cell under conditions sufficient for expression of any one of said polynucleotides.

20 17. A vaccine composition comprising an effective amount of the polypeptide of any one of claims 1 to 5 and a pharmaceutically acceptable carrier.

18. A vaccine composition comprising an effective amount of the polynucleotide of any one of claims 6 to 12 and a pharmaceutically effective carrier.

25 19. The vaccine composition according to either one of claims 17 or 18 wherein said composition comprises at least one other *Neisseria meningitidis* antigen.

20. An antibody immunospecific for the polypeptide or immunological fragment as

claimed in any one of claims 1 to 5.

21. A method of diagnosing a *Neisseria* infection, comprising identifying a polypeptide as claimed in any one of claims 1 - 5, or an antibody that is immunospecific for said polypeptide, present within a biological sample from an animal suspected of having such an infection.

22. Use of a composition comprising an immunologically effective amount of a polypeptide as claimed in any one of claims 1 - 5 in the preparation of a medicament for use in generating an immune response in an animal.

23. Use of a composition comprising an immunologically effective amount of a polynucleotide as claimed in any one of claims 6 - 12 in the preparation of a medicament for use in generating an immune response in an animal.

24. A therapeutic composition useful in treating humans with *Neisseria meningitidis* disease comprising at least one antibody directed against the polypeptide of claims 1 - 5 and a suitable pharmaceutical carrier.